

SEQUENCE LISTING

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Chugai Seiyaku Kabushiki Kaisha
Sumitomo Pharmaceuticals Company, Limited

<120> HLA-A24-RESTRICTED CANCER ANTIGEN PEPTIDES

<130> 540883HT

<140> PCT/JP03/07463

<141> 2003-06-12

<150> JP 2002-171518

<151> 2002-06-12

<150> JP 2002-275572

<151> 2002-09-20

<160> 68

<210> 1
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<213> Homo sapiens

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Met Gly Ser Asp Val Arg Asp Leu Asn Ala Leu Leu Pro Ala Val Pro
1 5 10 15

Ser Leu Gly Gly Gly Gly Cys Ala Leu Pro Val Ser Gly Ala Ala
20 25 30

Gln Trp Ala Pro Val Leu Asp Phe Ala Pro Pro Gly Ala Ser Ala Tyr
35 40 45

Gly Ser Leu Gly Gly Pro Ala Pro Pro Pro Ala Pro Pro Pro Pro Pro
50 55 60

Pro Pro Pro Pro His Ser Phe Ile Lys Gln Glu Pro Ser Trp Gly Gly
65 70 75 80

Ala Glu Pro His Glu Glu Gln Cys Leu Ser Ala Phe Thr Val His Phe
85 90 95

Ser Gly Gln Phe Thr Gly Thr Ala Gly Ala Cys Arg Tyr Gly Pro Phe
100 105 110

Gly Pro Pro Pro Pro Ser Gln Ala Ser Ser Gly Gln Ala Arg Met Phe
115 120 125

Pro Asn Ala Pro Tyr Leu Pro Ser Cys Leu Glu Ser Gln Pro Ala Ile
130 135 140

Arg Asn Gln Gly Tyr Ser Thr Val Thr Phe Asp Gly Thr Pro Ser Tyr
145 150 155 160

Gly His Thr Pro Ser His His Ala Ala Gln Phe Pro Asn His Ser Phe
165 170 175

Lys His Glu Asp Pro Met Gly Gln Gln Gly Ser Leu Gly Glu Gln Gln
180 185 190

Tyr Ser Val Pro Pro Pro Val Tyr Gly Cys His Thr Pro Thr Asp Ser
195 200 205

Cys Thr Gly Ser Gln Ala Leu Leu Leu Arg Thr Pro Tyr Ser Ser Asp
210 215 220

Asn Leu Tyr Gln Met Thr Ser Gln Leu Glu Cys Met Thr Trp Asn Gln
225 230 235 240

Met Asn Leu Gly Ala Thr Leu Lys Gly Val Ala Ala Gly Ser Ser Ser
245 250 255

Ser Val Lys Trp Thr Glu Gly Gln Ser Asn His Ser Thr Gly Tyr Glu
260 265 270

Ser Asp Asn His Thr Thr Pro Ile Leu Cys Gly Ala Gln Tyr Arg Ile
275 280 285

His Thr His Gly Val Phe Arg Gly Ile Gln Asp Val Arg Arg Val Pro
290 295 300

Gly Val Ala Pro Thr Leu Val Arg Ser Ala Ser Glu Thr Ser Glu Lys
305 310 315 320

Arg Pro Phe Met Cys Ala Tyr Pro Gly Cys Asn Lys Arg Tyr Phe Lys
325 330 335

Leu Ser His Leu Gln Met His Ser Arg Lys His Thr Gly Glu Lys Pro
340 345 350

Tyr Gln Cys Asp Phe Lys Asp Cys Glu Arg Arg Phe Ser Arg Ser Asp
355 360 365

Gln Leu Lys Arg His Gln Arg Arg His Thr Gly Val Lys Pro Phe Gln
370 375 380

Cys Lys Thr Cys Gln Arg Lys Phe Ser Arg Ser Asp His Leu Lys Thr
385 390 395 400

His Thr Arg Thr His Thr Gly Lys Thr Ser Glu Lys Pro Phe Ser Cys
405 410 415

Arg Trp Pro Ser Cys Gln Lys Lys Phe Ala Arg Ser Asp Glu Leu Val
420 425 430

Arg His His Asn Met His Gln Arg Asn Met Thr Lys Leu Gln Leu Ala
435 440 445

Leu

<210> 2
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic Peptide

<400> 2
Arg Tyr Phe Pro Asn Ala Pro Tyr Leu
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<210> 3
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<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic Peptide

<400> 3
Arg Tyr Pro Gly Val Ala Pro Thr Leu
1 5

<210> 4
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic Peptide

<400> 4
Arg Tyr Pro Ser Cys Gln Lys Lys Phe
1 5

<210> 5
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic Peptide

<400> 5
Ala Tyr Leu Pro Ala Val Pro Ser Leu
1 5

<210> 6
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic Peptide

<400> 6
Asn Tyr Met Asn Leu Gly Ala Thr Leu
1 5

<210> 7
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic Peptide

<400> 7
Arg Val Pro Gly Val Ala Pro Thr Leu
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<210> 8
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic Peptide

<400> 8
Arg Met Phe Pro Asn Ala Pro Tyr Leu
1 5

<210> 9
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<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic Peptide

<400> 9
Arg Trp Pro Ser Cys Gln Lys Lys Phe
1 5

<210> 10
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic Peptide

<400> 10

Gln Tyr Arg Ile His Thr His Gly Val Phe
1 5 10

<210> 11
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic Peptide

<400> 11
Ala Tyr Pro Gly Cys Asn Lys Arg Tyr Phe
1 5 10

<210> 12
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic Peptide

<400> 12
Arg Tyr Phe Pro Asn Ala Pro Tyr Phe
1 5

<210> 13
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic Peptide

<400> 13
Arg Tyr Phe Pro Asn Ala Pro Tyr Trp
1 5

<210> 14
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic Peptide

<400> 14
Arg Tyr Phe Pro Asn Ala Pro Tyr Ile
1 5

<210> 15

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic Peptide

<400> 15

Arg Tyr Phe Pro Asn Ala Pro Tyr Met

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5

<210> 16

<211> 9

<212> PRT

<213> Artificial Sequence

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<223> Description of Artificial Sequence: Synthetic Peptide

<400> 16

Arg Tyr Pro Gly Val Ala Pro Thr Phe

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5

<210> 17

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic Peptide

<400> 17

Arg Tyr Pro Gly Val Ala Pro Thr Trp

1

5

<210> 18

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic Peptide

<400> 18

Arg Tyr Pro Gly Val Ala Pro Thr Ile

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5

<210> 19

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic Peptide

<400> 19

Arg Tyr Pro Gly Val Ala Pro Thr Met
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<210> 20

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic Peptide

<400> 20

Arg Tyr Pro Ser Cys Gln Lys Lys Trp
1 5

<210> 21

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic Peptide

<400> 21

Arg Tyr Pro Ser Cys Gln Lys Lys Leu
1 5

<210> 22

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic Peptide

<400> 22

Arg Tyr Pro Ser Cys Gln Lys Lys Ile
1 5

<210> 23

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic Peptide

<400> 23

Arg Tyr Pro Ser Cys Gln Lys Lys Met
1 5

<210> 24

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic Peptide

<400> 24

Ala Tyr Leu Pro Ala Val Pro Ser Phe

1

5

<210> 25

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic Peptide

<400> 25

Ala Tyr Leu Pro Ala Val Pro Ser Trp

1

5

<210> 26

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic Peptide

<400> 26

Ala Tyr Leu Pro Ala Val Pro Ser Ile

1

5

<210> 27

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic Peptide

<400> 27

Ala Tyr Leu Pro Ala Val Pro Ser Met

1

5

<210> 28

<211> 9

<212> PRT

<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic Peptide

<400> 28
Asn Tyr Met Asn Leu Gly Ala Thr Phe
1 5

<210> 29
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic Peptide

<400> 29
Asn Tyr Met Asn Leu Gly Ala Thr Trp
1 5

<210> 30
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic Peptide

<400> 30
Asn Tyr Met Asn Leu Gly Ala Thr Ile
1 5

<210> 31
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic Peptide

<400> 31
Asn Tyr Met Asn Leu Gly Ala Thr Met
1 5

<210> 32
<211> 21
<212> PRT
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: Synthetic Peptide

<400> 32

Phe Asn Asn Phe Thr Val Ser Phe Trp Leu Arg Val Pro Lys Val Ser
1 5 10 15

Ala Ser His Leu Glu
20

<210> 33
<211> 3857
<212> DNA
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: The DNA region from position 1 to position 1550 is derived from human, and the DNA region from position 1551 to position 3857 is derived from mouse.

<400> 33
aagcttaactc tctggcacca aactccatgg gatgatttt cttctagaag agtccagggtg 60
gacaggtaaag gagtgggagt cagggagtcc agttcaggga cagagattac gggatgaaaa 120
gtgaaaaggag agggacgggg cccatgccga gggtttctcc ttgtttctc agacagctct 180
tgggccaaga ttccaggaga cattgagaca gagcgttgg cacagaagca gagggttcag 240
ggcgaagtcc cagggccccca ggcgtggctc tcagggtctc aggcccccaa ggcgtgtat 300
ggattgggga gtcccagcct tggggattcc ccaactccgc agtttctttt ctccctctcc 360
caacctatgt agggtcttc ttccctggata ctcacgcgc ggacccagtt ctcactccca 420
ttgggtgtcg ggttccaga gaagccaatc agtgtcgtcg cggtcgtctgt tctaaagtcc 480
gcacgcaccc accgggactc agattctccc cagacgcga gatggccgt catggcccc 540
cgaaccctcg tcctgcatac ctcgggggccc ctggccctga cccagacctg ggcaggtgag 600
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gaacttccta	gtgtcaagat	cttccctggaa	ctctcacagc	tttttttctc	acaggtggaa	2760
aaggagggga	ctatgctctg	gctccaggtt	agtgtgggg	cagagttgtc	ctggggacat	2820
tggagtgaaag	ttggagatga	tgggagctct	ggyaatccat	aatagctct	ccagagaaaat	2880
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ctctgggctc	tgttccctct	atcaactatga	gjcacatgt	gagagttgt	ggtcacaaaag	3780
acacagggaa	ggcctgagcc	ttgcccgtc	cccaggatta	tgagccccca	gggctaaaga	3840
tcagagactc	ggaattc					3857

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<210> 34
<211> 1119
<212> DNA
<213> Artificial Sequence
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<220>
<223> Description of Artificial Sequence: The DNA region from position 1 to position 618 is derived from human, and the DNA region from position 619 to position 1119 is derived from mouse.

<400> 34
atg gcc gtc atg gcg ccc cga acc ctc gtc ctg cta ctc tcg ggg gcc 48
Met Ala Val Met Ala Pro Arg Thr Leu Val Leu Leu Leu Ser Gly Ala
5 10 15

ctg gcc ctg acc cag acc tgg gca ggc tcc cac tcc atg agg tat ttc 96
 Leu Ala Leu Thr Gln Thr Trp Ala Gly Ser His Ser Met Arg Tyr Phe
 20 25 30

tcc aca tcc gtg tcc cgg ccc ggc cgc ggg gag ccc cgc ttc atc gcc 144
 Ser Thr Ser Val Ser Arg Pro Gly Arg Gly Glu Pro Arg Phe Ile Ala
 35 40 45

gtg ggc tac gtg gac gac acg cag ttc gtg cg^g ttc gac agc gac gcc 192
 Val Gly Tyr Val Asp Asp Thr Gln Phe Val Arg Phe Asp Ser Asp Ala
 50 55 60

gcg agc cag agg atg gag ccg cg_g g_c g_c tgg ata gag cag gag ggg 240
 Ala Ser Gln Arg Met Glu Pro Arg Ala Pro Trp Ile Glu Gln Glu Gly

65	70	75	80	
ccg gag tat tgg gac gag gag aca ggg aaa gtg aag gcc cac tca cag Pro Glu Tyr Trp Asp Glu Glu Thr Gly Lys Val Lys Ala His Ser Gln				288
85	90	95		
act gac cga gag aac ctg cgg atc gcg ctc cgc tac tac aac cag agc Thr Asp Arg Glu Asn Leu Arg Ile Ala Leu Arg Tyr Tyr Asn Gln Ser				336
100	105	110		
gag gcc ggt tct cac acc ctc cag atg atg ttt ggc tgc gac gtg ggg Glu Ala Gly Ser His Thr Leu Gln Met Met Phe Gly Cys Asp Val Gly				384
115	120	125		
tcg gac ggg cgc ttc ctc cgc ggg tac cac cag tac gcc tac gac ggc Ser Asp Gly Arg Phe Leu Arg Gly Tyr His Gln Tyr Ala Tyr Asp Gly				432
130	135	140		
aag gat tac atc gcc ctg aaa gag gac ctg cgc tct tgg acc gcg gcg Lys Asp Tyr Ile Ala Leu Lys Glu Asp Leu Arg Ser Trp Thr Ala Ala				480
145	150	155	160	
gac atg gcg gct cag atc acc aag cgc aag tgg gag gcg gcc cat gtg Asp Met Ala Ala Gln Ile Thr Lys Arg Lys Trp Glu Ala Ala His Val				528
165	170	175		
gcg gag cag cag aga gcc tac ctg gag ggc acg tgc gtg gac ggg ctc Ala Glu Gln Gln Arg Ala Tyr Leu Glu Gly Thr Cys Val Asp Gly Leu				576
180	185	190		
cgc aga tac ctg gag aac ggg aag gag acg ctg cag cgc acg gat tcc Arg Arg Tyr Leu Glu Asn Gly Lys Glu Thr Leu Gln Arg Thr Asp Ser				624
195	200	205		
cca aag gcc cat gtg acc cat cac agc aga cct gaa gat aaa gtc acc Pro Lys Ala His Val Thr His His Ser Arg Pro Glu Asp Lys Val Thr				672
210	215	220		
ctg agg tgc tgg gcc ctg ggc ttc tac cct gct gac atc acc ctg acc Leu Arg Cys Trp Ala Leu Gly Phe Tyr Pro Ala Asp Ile Thr Leu Thr				720
225	230	235	240	
tgg cag ttg aat ggg gag gag ctg atc cag gac atg gag ctt gtg gag Trp Gln Leu Asn Gly Glu Leu Ile Gln Asp Met Glu Leu Val Glu				768
245	250	255		
acc agg cct gca ggg gat gga acc ttc cag aag tgg gca tct gtg gtg Thr Arg Pro Ala Gly Asp Gly Thr Phe Gln Lys Trp Ala Ser Val Val				816
260	265	270		
gtg cct ctt ggg aag gag cag tat tac aca tgc cat gtg tac cat cag Val Pro Leu Gly Lys Glu Gln Tyr Tyr Thr Cys His Val Tyr His Gln				864
275	280	285		
ggg ctg cct gag ccc ctc acc ctg aga tgg gag cct cct cca tcc act Gly Leu Pro Glu Pro Leu Thr Leu Arg Trp Glu Pro Pro Pro Ser Thr				912
290	295	300		

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<210> 35  
<211> 372  
<212> PRT  
<213> Artificial Sequence
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<220>
<223> Description of Artificial Sequence: The polypeptide region from position 1 to position 206 is derived from human, and the polypeptide region from position 207 to position 372 is derived from mouse.

Ser Asp Gly Arg Phe Leu Arg Gly Tyr His Gln Tyr Ala Tyr Asp Gly
130 135 140

Lys Asp Tyr Ile Ala Leu Lys Glu Asp Leu Arg Ser Trp Thr Ala Ala
145 150 155 160

Asp Met Ala Ala Gln Ile Thr Lys Arg Lys Trp Glu Ala Ala His Val
165 170 175

Ala Glu Gln Gln Arg Ala Tyr Leu Glu Gly Thr Cys Val Asp Gly Leu
180 185 190

Arg Arg Tyr Leu Glu Asn Gly Lys Glu Thr Leu Gln Arg Thr Asp Ser
195 200 205

Pro Lys Ala His Val Thr His His Ser Arg Pro Glu Asp Lys Val Thr
210 215 220

Leu Arg Cys Trp Ala Leu Gly Phe Tyr Pro Ala Asp Ile Thr Leu Thr
225 230 235 240

Trp Gln Leu Asn Gly Glu Glu Leu Ile Gln Asp Met Glu Leu Val Glu
245 250 255

Thr Arg Pro Ala Gly Asp Gly Thr Phe Gln Lys Trp Ala Ser Val Val
260 265 270

Val Pro Leu Gly Lys Glu Gln Tyr Tyr Thr Cys His Val Tyr His Gln
275 280 285

Gly Leu Pro Glu Pro Leu Thr Leu Arg Trp Glu Pro Pro Pro Ser Thr
290 295 300

Val Ser Asn Met Ala Thr Val Ala Val Leu Val Val Leu Gly Ala Ala
305 310 315 320

Ile Val Thr Gly Ala Val Val Ala Phe Val Met Lys Met Arg Arg Arg
325 330 335

Asn Thr Gly Gly Lys Gly Asp Tyr Ala Leu Ala Pro Gly Ser Gln
340 345 350

Thr Ser Asp Leu Ser Leu Pro Asp Cys Lys Val Met Val His Asp Pro
355 360 365

His Ser Leu Ala
370

<210> 36
<211> 36
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: PCR primer

<400> 36
cccaagctta ctctctggca ccaaactcca tgggat 36

<210> 37
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: PCR primer

<400> 37
cgggagatct acaggcgatc aggtaggcgc 30

<210> 38
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: PCR primer

<400> 38
cgcaggctct cacactattc aggtgatctc 30

<210> 39
<211> 38
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: PCR primer

<400> 39
cggaattccg agtctctgat cttagccct gggggctc 38

<210> 40
<211> 29
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: PCR primer

<400> 40
aggacttgga ctctgagagg cagggtctt 29

<210> 41
<211> 30
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: PCR primer

<400> 41
catagcccc tcctttcca cctgtgagaa 30

<210> 42
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: PCR primer

<400> 42
cgaaccctcg tccttgctact ctc 23

<210> 43
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: PCR primer

<400> 43
agcatagtcc cctcctttc cac 23

<210> 44
<211> 39
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: PCR primer

<400> 44
cccaagctc gccgaggatg gccgtcatgg cgcccgaa 39

<210> 45
<211> 41
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: PCR primer

<400> 45
ccggaattct gtcttacgc tagagaatga gggtcatgaa c 41

<210> 46
<211> 9

<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 46
Pro Tyr Val Ser Arg Leu Leu Gly Ile
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<210> 47
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<220>
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<400> 47
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<210> 48
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<400> 48
Thr Tyr Ala Cys Phe Val Ser Asn Leu
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<210> 49
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Gln Tyr Ser Trp Phe Val Asn Gly Thr Phe
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<210> 50
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<210> 57
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<210> 59
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Arg Met Pro Ser Cys Gln Lys Lys Phe
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Ala Phe Leu Pro Ala Val Pro Ser Leu
1 5

<210> 61

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Ala Met Leu Pro Ala Val Pro Ser Leu
1 5

<210> 62

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Ala Trp Leu Pro Ala Val Pro Ser Leu
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<210> 63

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<210> 67
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<210> 68
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<223> Xaa at position 5 stands for Abu.

<400> 68
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1 5